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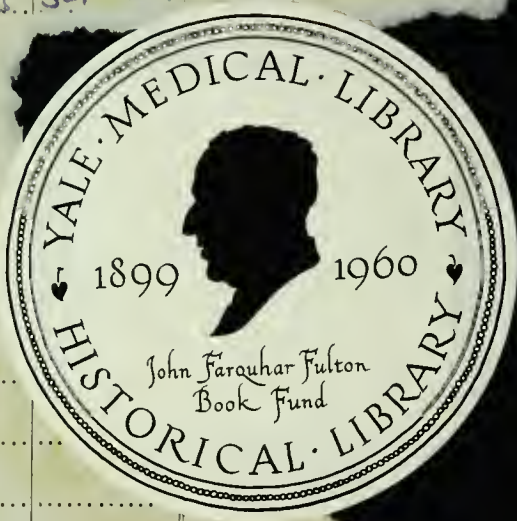
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TROPICAL VEGETATION OF THE SOUTH OF FRANCE.

THE CLIMATE
OF THE
SOUTH OF FRANCE,
AND ITS VARIETIES MOST
SUITABLE FOR INVALIDS;
WITH REMARKS ON
ITALIAN AND OTHER WINTER STATIONS.

BY

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CHEST AT BROMPTON.

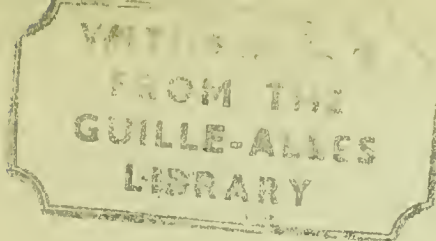


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PREFACE.

THE object of the following pages is to give a brief and impartial survey of the climate of the South of France, and its varieties best suited to pulmonary invalids.

My information has been derived partly from friends resident in the localities described, but chiefly from my own personal observations made during three visits to, and a prolonged sojourn in, this beautiful region.

To render the little work more complete, a few practical hints as to the invalid's life in this climate have been introduced, and also a short account of Italian and other winter stations.

I have to acknowledge valuable aid from the experience and suggestions of my father, Dr. C. J. B. Williams; and my brother, Mr. H. S. Williams,

late scholar of St. John's College, Cambridge, has greatly assisted me in the meteorological portion of the work. In connection with this subject I think it right to mention, that although the general results of observations have alone been stated, the ample data which supply them have been carefully examined, but are too voluminous for publication.

49, UPPER BROOK STREET,
GROSVENOR SQUARE;
August, 1867.

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THE CLIMATE OF THE SOUTH OF FRANCE.

CHAPTER I.

GENERAL ADVANTAGES.

THE sunny Mediterranean shore of France has long been recognised as a fitting winter residence for invalids afflicted with chronic diseases of the lungs; and of late years the portion situated east of Toulon, including the newly annexed department of "Alpes Maritimes," has been preferred on account of the shelter afforded to it from northerly winds by the mountain ranges of the Maures, the Estrelles, and the Maritime Alps. This region, which is limited eastwards by the Italian frontier, and includes the towns of Hyères, Cannes, Nice, and Menton, is remarkable for the luxuriance and semi-

tropical character of its vegetation, and enjoys a climate unequalled, within the same latitudes, in Europe, and unsurpassed in the more southerly latitudes of Spain and Italy. Its flowers furnish London and Paris with the greater portion of the perfumes used in those cities; while its olives produce an oil of the purest quality, and on that account preferred for pharmaceutical purposes.

The able works of Sir James Clark, Dr. Edwin Lee, Dr. Henry Bennet, and many French writers, have rendered this region comparatively familiar to English physicians; and the completion of the railway from Paris to Nice has made it so easy of access, that it has become the most popular wintering place in Europe.

Before examining in detail the elements of the French Mediterranean climate, some of the general advantages of the invalid's life in this region must be noticed. The chief of these is the amount of sunshine which he enjoys for weeks, and even months together, when the sun often rises in a cloudless sky, shines for several hours with a brightness and warmth surpassing that of the British summer, and then sinks without a cloud behind the secondary ranges of the Maritime Alps, displaying in his setting the beautiful and varied succession of tints

which characterise that glorious phenomenon of the refraction of light, a southern sunset; while he imparts to the rugged mountains a softness of outline and a brilliancy of colouring which defy description alike by the painter's art and the writer's pen. Owing to this genial influence, not accompanied, as it is in even the most protected of English wintering places, by any sensation of chill or damp, and the chemical effect of which is seen in the tanning of the skin,—owing to the freedom of the climate from rapid and constantly recurring changes of frost, rain, mist, and mild weather, the invalid spends the greater part of the day in the open air, and scarcely knows what confinement within doors means. The exciting causes of his complaint being removed, and the long spell of propitious weather enabling the full influence of the genial atmosphere to act on his frame, his bodily vigour gradually returns, and he finds himself able to enjoy a fair amount of exercise, whether walking, riding, or driving, in a region in which earth, sea, and sky present to his observation phenomena so varied in form, so brilliant in colour, and so wondrous in beauty, that an inexhaustible feast unfolds itself to his astonished gaze, in the enjoyment of which his attention is withdrawn from the contemplation and ofttimes the exaggera-

tion of his own symptoms, and directed to higher and nobler objects.

In the early stages of phthisis, and especially when the patient is a young or active-minded man, struck down by overwork or sudden exposure, this cheering influence is most beneficial. It is of great importance that while taking the needful care of himself he should not degenerate at an early age into a hopeless valetudinarian; especially as an every day increasing mass of evidence warrants us in believing that under the influence of medicine and climate a large number of these patients gradually recover their health and lead useful lives, and, with due care, lives of no inconsiderable duration. The freedom from restraint, and the liberty of exercise which the equable climate of the south of France allows, give this class of patients an appearance far different from that presented by the same class at English wintering places. While the sun shines, they certainly do not lead an invalid existence, but, on the contrary, act like other people, and it is often impossible for a casual observer to detect any difference in them from the healthy. When the sun sets, their invalid life commences, and continues till his morning rays release them from confinement.

In the very advanced stage of phthisis, where the

disease is very extensive, and where little hope of recovery can be justly entertained, it is not as a rule advisable to exile patients so far from their home, or to incur the risk of a deathbed in a foreign land. Still on many the cheering influence of nature's beauties in this bright region is not without its beneficial effect. Often, according to a talented author, the pleasure they derive from gazing on fair scenes has a peculiar intensity from their knowledge that its duration is limited, and that "the pallid king may at any time make that not unexpected knock and summon them away."

When I was observing the invalid's life in this region, one feature of it struck me as a forcible illustration of the equability of the climate. It was the comparatively rare occasions on which he has to call in medical aid. Of course there are a certain number of patients who require here, as elsewhere, regular medical attendance; but the greater proportion, and especially those in the earlier stages of consumption, after receiving instructions from the local physicians as to lodging, diet, exercise, and medicine, continue to carry them out regularly for weeks and months at a time, without the occurrence of fresh complications, and therefore without the necessity for fresh advice. When the weather

becomes unfavorable, when exercise is curtailed or wrongly indulged in, when excesses of diet are committed, complications arise, which require the active interference of the physician ; and fortunately an efficient British staff is at hand, many members of which are themselves living examples of the healing influence of the climate. Patients should never neglect to consult a doctor on their first arrival, as his experience and advice with regard to lodgings, food, &c., are of great value, and may often prevent them from falling into bad hands, or settling in unhealthy localities.

I have drawn attention to the favorable features of the invalid's life in this climate, but the unfavorable should not be overlooked. It must be admitted that the food is, on the whole, inferior to what we are accustomed to in England : the habits of the people are less cleanly ; and the appliances for invalids are neither so good nor so numerous as in some of the British wintering places. The dryness and stimulating influence of the climate, in some of the health resorts, occasionally prevent patients from sleeping so long or so soundly as they are accustomed to in England ; and the distance of this region from home will always cause the British wintering to be preferred for advanced cases.

We can now proceed to examine the leading aspects of this climate; to notice in what points it differs from our own; what varieties it presents, and to what morbid states of the body each is applicable. For the sake of convenience it will be well to arrange these aspects into two groups—

1. Physical, including Thermometrical, Hygrometrical, and other Meteorological phenomena.

2. Medical—*i. e.*, the Effects of the Climate on Health and Disease.

CHAPTER II.

PHYSICAL ASPECTS.

WE have to consider under this heading the principal phenomena of the climate, and we will commence with the *Thermometrical phenomena*.

In discussing the mean temperature of the region collectively, it will be advisable to allow it to be represented by that of Nice. This is rather below the figure that would properly represent it; but the difference is small, and will not materially influence our comparisons.

The mean annual temperature of Nice is $59\cdot4^{\circ}$ Fahr.; that of London being $50\cdot3^{\circ}$ Fahr.; that of Torquay $52\cdot1^{\circ}$ Fahr., and of the Cove of Cork, in Ireland, $51\cdot9^{\circ}$ Fahr. I have chosen Torquay as a standard of comparison, because it has the highest annual mean temperature in Great Britain; and the Cove of Cork has been selected for the same reason in Ireland. In spring and winter mean temperatures it is only equalled by Penzance, all the other English wintering places having much lower standards. The mean autumnal temperature of Nice is

61·6° Fahr., compared with 51·3° Fahr. of London, 53·1° Fahr. of Torquay, and 52° Fahr. of the Cove of Cork. The winter *mean*, which is of the most importance to invalids, is 47·8° Fahr. at Nice; while that of London is 39·1° Fahr., that of Torquay 44° Fahr., and of the Cove of Cork 44·1° Fahr. The *mean* in spring is 56·2° Fahr., compared with 48·7° Fahr. of London, with 50° Fahr. of Torquay, and 50·1° Fahr. of the Cove of Cork.

It will be seen from these numbers that this region enjoys a great superiority in point of annual, winter, spring, and autumnal mean temperatures over any spot in the United Kingdom. It has a mean annual temperature of 9·1° Fahr. higher than London, and 7° Fahr. higher than Torquay or the Cove of Cork. But the winter *mean* is the one we have chiefly to do with; and in this point the Mediterranean region has the advantage by 8·7° Fahr. over London, by 3·8° Fahr. over Torquay, and by 3·7° Fahr. over the Cove of Cork.

The contrast between the winter climate of this region and that of England was seldom more marked than during the past season, 1866-67. On examining the Hyères thermometrical observations which are most carefully registered by Dr. Griffith, the resident physician, I find that the visitations of

terribly cold weather, and the extreme fall of temperature, which prevailed in England and Northern Europe, never penetrated to this corner of the south of France. Subjoined is a comparison of the “maximum” and “minimum” Fahr. temperatures at Kew and Hyères during the most severe periods of the winter.

		MINIMUM.				MAXIMUM.	
		Kew.	Hyères.			Kew.	Hyères.
1867.							
January 2	...	19·9	50·0	...		28·7	54·0
3	...	5·7	52·0	...		28·6	55·0
4	...	5·0	54·0	...		16·4	57·0
5	...	1·0	52·0	...		30·8	56·0
14	...	10·5	58·0	...		29·8	65·0
15	...	14·3	56·0	...		31·3	64·0
March 17	...	27·3	53·0	...		36·9	67·0
18	...	11·5	55·0	...		32·7	67·0

It will be seen from this table how marvellous the difference between the “minima” was, amounting on one occasion to 51° Fahr.; and also what a small amount of variation occurred in the minima at Hyères. Throughout the entire winter the temperature, on only two occasions, fell as low as 32° Fahr., and never below that point; and the weather was, as usual, sufficiently warm and mild to admit of patients sitting out in the open air for the greater part of the day. At Nice the military band played

twice a week in the public gardens ; and at each performance upwards of 1000 chairs were occupied by visitors and invalids listening to the music. Balls were held in January on board the American men-of-war anchored at Villafranca, and were attended by numbers of ladies and gentlemen from Nice, who were conveyed to and from the ships in open boats.

What are the causes of this great superiority in mean temperature? Let us examine the sources of warmth in the British and French mild climates respectively.

In the case of the British the chief source is undoubtedly the Gulf stream ; which, although it raises the temperature of these islands, and, as Dr. Tyndall has well shown, prevents the formation of gigantic glaciers, has the disadvantage of saturating our atmosphere with moisture, and of adding considerably to the amount of rainfall.

In the south of France the chief sources of its superior warmth are :—

1st. The sun pouring down his warm rays, unchecked in their effects by chill blasts, and rarely obscured by clouds or mist, from sunrise to sunset. The patient arriving in the south of France in winter, sees to his surprise the dust lying on the road ; the hills and valleys not bare, as in the land he has lately left,

but clothed with evergreens of varied tints, and decked with spring flowers. He sees the walls and rocks apparently alive with lizards, and the air teeming with butterflies and dragonflies, as in summer. His own sensations give him the idea that it is June, and not January, and he forthwith acts accordingly, and dispenses with his overcoat and respirator. For seven or eight hours of the day he can enjoy sunshine, and take walks and rides, or sit on the ground, basking in the warm rays like a lizard. Perhaps this last strikes him more than any other sensation, that he can sit or lie on the soil, for hours at a time, without the slightest sensation of chill or damp—a proceeding which he could never attempt with safety during any winter month in England. He is soon, however, reminded that it is winter by the shortness of the day, the sun setting and night closing in very rapidly. After sunset the temperature falls considerably, as in all countries where the sky is clear; because the radiated heat of the cooling earth is not reflected back to it by layers of clouds, as in England. Heavy dew is not uncommon, and is so white that it is often mistaken for hoar-frost. The freezing point is, however, seldom reached, nor indeed a temperature much below 45° Fahr.; but the lowness of the temperature is not

the phenomenon which affects the patient so much as the rapid fall from a high point to a moderate one. This evil effect is easily guarded against. The patient repairs to his room, which, with the windows open, has been basking like himself in the sun all day; and half an hour before sunset the windows are closed; and the heat absorbed during the day is sufficient to keep it at a temperature of 55° Fahr. and upwards, till the next morning. This, I must say, would only apply to rooms facing south or south-west, and not on the ground floor; but the rooms selected for patients are generally first or second floor, and with a southern aspect.* Fires are wanted

* A lady who passed last winter at Hyères has kindly favoured me with thermometrical observations made twice a day for three weeks in an *unoccupied south room*, which had the windows open in the daytime, and was without fire.

1867.	9 A.M.	9 P.M.	1867.	9 A.M.	9 P.M.
February 20	62	...	61	March 4	57 ... 56
21	61	...	60	5	57 ... 57
22	61	...	—	6	56 ... 56
23	62	...	61	7	56 ... 57
24	62	...	62	8	57 ... 58
25	64	...	62	9	58 ... 58
26	64	...	62	10	60 ... 64
27	64	...	63	11	62 ... 62
28	64	...	63	12	62 ... 64
March 2	58	...	57	13	62 ... 64
3	57	...	56		

in ground floors, but seldom in upper floors, except during rainy weather.

2nd. The Mediterranean Sea. This body of water presents three important differences from the Atlantic Ocean.

(1.) It has hardly any tide. It is popularly reported to have none at all; but a difference of as much as two feet can be discerned in its most deeply indented bays.

(2.) It contains a larger amount of saline matter than the Atlantic under the same latitude. Messrs. Bouillon Lagrange and Vogel analysed the waters of these seas near Bayonne and Marseilles with the following results :

		Saline residue in 100 parts.
Atlantic, off Bayonne	...	3·80
Mediterranean, off Marseilles	...	4·10

The results of sea-water analyses admit of great variations dependent on the depth from which the water is taken; on the latitude of the locality; and its nearness to, or distance from, the mouths of large rivers. As far as can be ascertained, these points were taken into consideration by the above-named eminent chemists: for Marseilles lies in nearly the same latitude as Bayonne (Bayonne is slightly more northern); the water was taken from

the same depth in both cases; but the saltness of the Mediterranean is probably reduced at Marseilles by the large volume of fresh water which the Rhone brings down into the sea near that city. The above analyses assign an excess of saline matter to the Mediterranean* in the ratio of 41 to 38 in 1000 parts, or 3 per 1000, and were it not for the last consideration the excess would probably be greater. This extra saltness arises from loss of water by the rapid evaporation from the surface of the Mediter-

* A comparison between the analyses of the Mediterranean and the British Channel is also interesting; as it displays this excess in a still more marked degree, and points out to what constituents it is chiefly due.

Amount of saline matter in 1000 grammes of each sea.

	British Channel. (Schweitzer)		Mediterranean. (Laurent.)
Chloride of sodium	27·06	...	27·22
Chloride of potassium.....	·76	...	·01
Chloride of magnesium	3·67	...	6·14
Sulphate of magnesia	2·29	...	7·02
Sulphate of lime	1·41	...	·15
Bromide of magnesium	·03	...	·00
Carbonate of lime	·03	...	·20
	<hr/> 35·25		<hr/> 40·74

The excess amounts to $5\frac{1}{2}$ parts in 1000, and is chiefly caused by the Mediterranean containing nearly twice as much chloride of magnesium, and more than three times as much sulphate of magnesia.

anean, due to its warm climate ; a loss, which its tributary rivers pouring in a smaller volume of fresh water than those of the Black Sea or Baltic, fail to replace.

(3.) At the places under consideration its temperature is five or six degrees higher than that of the Atlantic under the same latitude.*

The first and second points of difference probably exercise some slight influence over the temperature of this region ; but it is to the third, viz., to the superior warmth of the Mediterranean, that its shores owe their comparative freedom from the depressions of temperature so common in the neighbouring inland places. This sea, though not acting the same part in this climate that the Gulf stream does in the British, is an important auxiliary to the temperature ; whilst, by its equalizing influence, it obviates the bad effects of clear skies, and often prevents its shores from sinking below the freezing point through nocturnal radiation. Its superior warmth is explained by Dr. Bennet by the absence of polar currents ; but I think the true explanation is to be

* According to the Rev. R. D. Graves' observations at San Remo, the temperature of the Mediterranean during the day, at a depth of four feet, in the months of November, December, and January, was never below 60° Fahr.

found in the tendency of an inland sea to equalize the temperature of all its coasts—a tendency evidently favorable to the northern coast of the Mediterranean.

Hygrometrical phenomena.—These are very important in themselves, independently of their influence on the temperature. First let us consider the rainfall.

The general law of the rainfall in a country is, that, other influences being equal, the *annual fall* of rain is *greater* the *nearer* the country lies to the *equator*, and the *number of rainy days* is *greater* the *nearer* the country lies to the *poles*.* Thus, at St. Petersburg the mean annual rainfall is 17 in., and it is distributed over 170 days; while at the equator, where the mean amount is 95 in., the whole is precipitated in 80 days.

It would be expected that, in accordance with this law, the rainfall in the south of France would be greater than in Great Britain, but such is not the case. The average annual amount at Nice is 25 in., nearly the average at Greenwich, smaller than that of Torquay, which is 28 in., and that of Penzance, which is 44 in.

The law holds good with regard to the number of

* Scoresby Jackson's 'Medical Climatology,' p. 19.

rainy days, which differs vastly in the two climates. The 25 inches fall in 155 days at Greenwich; whereas the same amount falls in 70* days at Nice. The rain comes down generally in very heavy showers, sometimes as much as $4\frac{1}{2}$ in. in 10 hours; whereas the heaviest rainfall during 24 hours on record at Greenwich is $2\frac{1}{2}$ in. It is manifest that this diminution in the number of rainy days, and therefore increased facility for taking exercise, must be of considerable benefit to patients, as also the decreased amount of moisture in the atmosphere.† This is ascertained by the hygrometer, of which there are several forms, but the one generally used is the wet bulb hygrometer. From observation made on this instrument at Mentone by Dr. Henry Bennet during the winter months of 1864–65, it appears that the average difference of temperature between the wet and the dry bulbs

* Valcourt: Rouhandi states the number to be 60.

† It has been found that the influence of the sun's direct rays in raising the temperature of objects is augmented by the presence of a *limited* amount of aqueous vapour, which obstructs the escape of their heat. Thus, Schlagintweit (Proceedings of Royal Society, March, 1865) found that the difference between the temperatures of thermometers exposed in sun and shade in India, was much greater, *cæteris paribus*, in localities on its moist seaboard, than in those of its arid interior; and the scalding influence of the sun's rays between heavy showers, a commonly observed phenomenon, may be attributed to the same cause.

was $6\cdot7^{\circ}$ Fahr. At Hyères, during the same period, my friend Dr. Griffith found it to amount to nearly $5\cdot0^{\circ}$ Fahr. At the Military Hospital of Nice the carefully-recorded figures of Dr. Cabrol (kindly forwarded to me by Dr. Beaugrand), for the same period, show a mean average of $4\cdot92^{\circ}$ Fahr. The Military Hospital is situated at some distance from the sea, and near Carabacel; and it is probable that the average difference in the town of Nice would be greater still.

Contrast these observations with similar ones made at Kew during the same winter months, where the average difference was only $1\cdot46^{\circ}$ Fahr.—*i. e.*, less than one fourth of the difference at Mentone, and less than one third of the difference at Hyères and Nice. I may here remark that the Mentone average difference for the *winter* 1864–65 was actually greater than the average difference at Greenwich and Kew during the *summer*.

From this wonderful dryness of the atmosphere there results an almost total immunity from fogs.

We now come to *other meteorological phenomena*. Under this heading I have arranged certain phenomena, which cannot be discussed as purely thermometrical or purely hygrometrical, though they have an important bearing on both.

Firstly, the prevalence of certain winds. The

region which we are considering is protected from the north wind, and, with the exception of Nice, from the north-east or *bise* wind; but it is influenced to a certain extent by the *mistral* or north-west wind, to which we will now turn our attention.

The mistral is a wind of prodigious force: often sufficiently strong to blow a man off his horse. It occasionally overthrows the largest trees, and spreads destruction among the corn and vine crops. The trees generally have their branches twisted in the direction of its current; and in the places most exposed to its blasts, screens of wood and stone are erected to protect the vines. It is for the most part a dry wind, parching up the country, and withering the leaves of plants by its desiccating influence. The barrenness of the low ranges of mountains near Marseilles may be attributed to this cause. Its dryness is shown by its effect on the hygrometer, which sometimes during its prevalence indicates a difference of as much as 10° Fahr. between the bulbs.

Various theories have been started as to its origin. M. Martins considers that it is the result of the denudation of the Rhone basin by the destruction of its forests; and he alleges that in the time of Julius Cæsar, who described this country as covered with forests, this wind did not exist. "When," says M.

Martins, "the denuded crests of the mountains and the hilly plains become heated by the sun's rays, the air in contact with them, being likewise heated, dilates and rises into the higher regions like that from a chimney where a strong fire is burning. The colder and heavier air which surrounds the snowy summits of the Alps precipitates itself in an aërial torrent to fill up the partial void which has been occasioned by the ascent of the lower stratum of air. Were the country covered anew with forests the causes productive of the mistral would be in a great measure removed." It will be observed that this theory represents the mistral as a cold current coming from the Alps; but unfortunately the Alps lie *north-east* of the district where the mistral is most felt, and an aërial current coming from them would therefore give rise to a *north-easterly* wind, and *not* a *north-westerly*.

Dr. Bennet considers that it is sometimes a local wind, originating in the south of France and causing a clear sky; at other times a grand north-west European wind, coming from the North Seas and North-West Atlantic; and he states that then it occasionally, though rarely, brings with it black clouds. With reference to this view I may observe:—

1stly. That the gigantic force of this wind cannot

be satisfactorily accounted for by any theory assigning it a merely local origin. The difference in temperature between the region to the north and west of the parts ravaged by this wind is quite insufficient to account for its powerful blasts.

2ndly. That any wind passing from the North Seas to the region under consideration would be a north-east wind, since the effect of the earth's rotation upon a wind blowing from the North Pole to the Equator would be to convert it into a north-east wind.

I therefore feel bound to reject the explanations hitherto given of this wind's origin as unsatisfactory.

In France the mistral is only known in the parts lying near the Mediterranean coast, and to the east of the Cevennes range of mountains ; for north-west winds experienced in other parts of that country are of an entirely different nature, being more or less moist, and not possessed of great force. Therefore, as it has been shown that the mistral cannot have a mere local origin, it exists probably as an upper current and descends on the region under consideration. And this is the more probable, because the formation of powerful upper aërial currents is attended with less difficulty than that of surface winds, in consequence of their not being subjected to

friction with the earth's surface. It will be seen that the foregoing conclusion affords a satisfactory explanation of the *dryness* of this wind. For even if the upper atmospheric current were saturated with moisture, yet the amount of vapour held in suspension must be small on account of the lowness of the temperature; and when that temperature is raised by the compression which follows its descent into the lower atmospheric regions, the aërial current must be far from a state of saturation. In fact, as the mistral must come from the direction of the Atlantic, I do not see how its dryness can be satisfactorily accounted for in any other manner. But why does such a current descend upon this particular region? Doubtless because the air over the warm Mediterranean basin becoming heated and rarefied, a partial vacuum is produced, into which the cold upper current descends. I think, therefore, I am fully justified in assuming that the mistral must be caused by an upper aërial current descending on this region. It remains for me to explain how such an upper current may be formed.

A glance at the map shows that the south coast of France is in the same latitude with the south of Canada, where the winters are extremely severe, mercury having been known to freeze; and on cast-

ing our eyes farther north we come to the cold regions of British North America and the great Arctic Archipelago. There will be no difficulty in accounting for the low temperature of any wind blowing from this quarter. It will also be seen on inspecting any map of America showing the lines of equal mean January temperature, that the coldness of the British North American climate increases rapidly as we proceed westwards into its interior, such increase of coldness being fully as great as what would be encountered in proceeding from south to north. The intense cold of the interior parts of this region tends to produce an atmospheric current outwards in a direction at right angles to these isothermal lines. This will be found to be a direction from west-north-west. Such a current, which would probably extend to a considerable height in the atmosphere, would be raised in altitude by encountering the high lands of Labrador, lately surveyed by Professor Hind; after which, it, or at any rate the upper portion of the current, might continue its course at a height above the Atlantic, crossing the North Polar current and the Gulf stream as an upper atmospheric current.

But, it may be asked, why should not this current descend to supply the partial vacuum caused by the

heating and rarefaction of the air in contact with the Gulf stream? Such a descent is rendered improbable by the nature of the stratum of air overlying this warm stream. It must be loaded with aqueous vapour. Now, the experiments of Dr. Tyndall show that the heat-absorbing powers of aqueous vapour are enormous; that although in pure atmospheric air its amount in atoms is only 1 to 200 of oxygen and nitrogen, the single atom of aqueous vapour absorbs more heat than the 200 atoms of oxygen and nitrogen collectively, and compared with the action of a single atom of oxygen or nitrogen, its heat-absorbing power is 16,000 times as great. The stratum of air in contact with the Gulf stream is, as has been stated, loaded with aqueous vapour, and therefore is possessed of absorbing properties sufficient to form a screen nearly impervious to the heat radiated from the warm body of water. Owing to this, and also to the feeble radiating power of water, the decrease in temperature in ascending to the upper strata of the atmosphere overlying this stream must be much more rapid than in ascending into atmospheric strata overlying land. Such being the case, it is clear that the rarefaction produced by the warmth of the Gulf stream would not extend to any considerable height in the atmosphere. Moreover, the partial

vacuum before mentioned is supplied by the upper equatorial current, which here descends and forms the south-west wind prevalent in the temperate regions of the Atlantic. The west-north-west current would, therefore, continue its course as an upper atmospheric current little affected by the warmth of the Gulf stream, and could not hold any great amount of moisture by reason of its low temperature. This current would, if not acted upon by disturbing influences, cross the Atlantic as an upper west-north-west current. But as the effect of the earth's rotation upon a north wind in the northern hemisphere is to give it an easterly tendency, and transform it into a north-east wind, so this easterly tendency, in the case of a west-north-west current, would convert it into a north-west current. This north-west current would, as before pointed out, descend upon the warm Mediterranean basin as a dry north-west wind. Hence the mistral.

It appears from hygrometrical observations that the mistral, although dry, is not so dry as the bise or north-east wind prevalent at Nice, and in some other parts of the south of France—a circumstance which is evidently in complete harmony with this theory, as the aërial current in passing above the Atlantic must receive some vapour; and although not suffi-

cient in amount to prevent its being a dry wind for the reasons before indicated, yet we should expect to find it moister than the north-east wind, which must have crossed the Alps before its arrival at Nice and other southern places.

I am aware that this theory would require a considerable amount of evidence to establish its truth ; but it appeared to me reasonable, as it suggests a cause worthy of so powerful an effect as the mistral, by assigning to it a cosmical origin. This is analogous to the explanation given of other powerful currents, as the monsoons and the south-west equatorial current, &c. However, as yet I can offer it only as an hypothesis, the truth of which must be tested by subsequent observation.

The southerly winds, which prevail in the south of France, are for the most part moist, and generally accompanied by clouds and rain. Beyond their bringing saline breezes and occasionally boisterous weather, they are not injurious. An exception, however, is the south-east, a sirocco wind ; which is in general warm, and in the more sheltered watering-places occasionally causes a decidedly oppressive state of atmosphere. At Hyères it is annoying, because it blows into the town the dust of the plain intervening between Hyères and the sea. It is,

however, a moist wind, and rain soon follows to lay the dust. Dr. Bennet describes this wind at Mentone as having "all but lost the languor-giving properties which distinguish it at Naples." He states that it sometimes becomes exceedingly cold in winter from the presence of a large amount of snow on the mountains of Corsica; and that it may even cause a fall of snow at Mentone, which occurred in the very severe winter of 1863-64. My own experience of this wind at Nice and Mentone is, that it is moister than in South Italy, but at times very warm and enervating. The east wind, which is scarcely felt except at Nice and Cannes, is less dry than in England; and the west wind retains its usual character of greater humidity, but is not so loaded with moisture as in England.

Secondly. The climate is considerably influenced by the neighbourhood of mountain ranges. This is an important feature of this climate, as it is through this region being situated to the south of mountains, that it owes its general protection from northerly winds. There is an important point to be considered when we attempt to judge of the shelter which a mountain to the north of a town affords—namely, whether the town is situated immediately *under* the mountain or *at some distance* from it. This

constitutes the chief cause of difference between the climates of Nice and Mentone. Nice is situated upwards of three miles from the base of its projecting chain, and therefore does not enjoy the same immunity from northerly winds that Mentone does, which lies immediately under an amphitheatre of mountains.

The health resort should be situated immediately under, or on the lower slopes of, the protecting range, which should be wooded to the summit, and not sufficiently lofty to allow snow to rest for a long period in winter; or the streams which descend its sides will be reduced in temperature, and bring down currents of cold air with them. Hyères is greatly favoured in these respects, as it is sheltered by wooded hills of no great height, and lies at a considerable distance from snow ranges and mountain torrents. Cannes is much nearer to the snow-capped mountains; but the adjoining hills are well wooded, and few streams reach its valley. Nice is unfortunately influenced by the torrent Paillon, which is cooled by the glaciers of the Col de Tende range: and Mentone, though enjoying excellent shelter, is intersected by torrents which, descending from the Maritime Alps, traverse its protected area.

CHAPTER III.

HEALTH RESORTS—HYÈRES—CANNES—NICE — CIMIEZ
—CARABACEL—MENTONE.

THE principal meteorological phenomena presented by the climate of the whole region having been considered in the last chapter, we can now direct our attention to the modifications of it found in the individual health resorts; and these will be described briefly, but faithfully, in the order in which they are approached by rail from Paris. The first arrived at, after one hour and three quarters' journey from Marseilles, or nineteen hours from Paris, is *Hyères*, a town of 10,000 inhabitants, situated in latitude $43^{\circ}7'$ N., and the nearest and the most southerly of all the French winter resorts. The town is built on the most southern slope of one of a range of hills called the Maurettes, and faces south and south-east. It is distant about three miles from the Rade d'Hyères, an inlet of the Mediterranean, the intervening space consisting of a very fertile plain. The valley of

Hyères runs in a north-westerly direction back from the sea, between the well-wooded ranges of the Paradis and the Maurettes, and opens on to the town and harbour of Toulon, another inlet of the Mediterranean, being to a certain extent closed in by the picturesque mountains over that seaport. On approaching Hyères from Toulon, a sensible difference, as Dr. Edwin Lee justly remarks, is experienced in the temperature, owing to the southern portion of the valley being more sheltered; and its increased fertility is shown in the extreme luxuriance of the vegetation. The ranges of the Paradis and Maurettes, instead of being bare, like the majority of the mountains of Provence, are clothed to their summits with pine and cork trees. In the valley abundant crops of corn, wine, and oil are produced apparently on the same spot of ground, the wheat and the vine crops attaining to maturity even under the shade of the olive trees. Oranges and lemons are neither so fine nor so abundant as at Nice and Mentone; but the aloe and cactus, common throughout this region, grow in great luxuriance and profusion at Hyères. The striking feature of the vegetation, and one which imparts a tropical aspect to the landscape, is the presence of the palm-tree in numbers and rare beauty, attaining a greater height and a finer growth here than in any

other part of France. In M. Denis's garden are to be seen no less than fifteen different varieties of this tree, many of which are natives of the Cape of Good Hope, flourishing in the open air. The date-palm, *Phoenix dactylifera*, is the most common; but other varieties, including the fan-palm, *Chamærops Fortunei*, are not wanting. M. Denis has exhibited some fine date-palms in the Jardin Reservé of the Paris Exhibition (1867); and one of them is of remarkably vigorous growth and has growing around it young ones self-sown. The wild flowers are abundant and of varied and brilliant colours. According to Mr. Timins's observations, they bloom somewhat earlier here than at Cannes.*

* The Rev. D. C. Timins, M.A., Oriel Coll., Oxon., has kindly favoured me with the time of appearance of the following plants in bloom at Hyères and at Cannes respectively. These observations were made by Mr. Timins, at Cannes, in 1865, and at Hyères, in 1866.

	Hyères.		Cannes.		Difference.
Anemone hortensis	Jan. 17	...	Jan. 26	...	9 days
coronaria	Feb. 6	...	Feb. 17	...	11 "
pavonina	Feb. 16	...	March 17	...	29 "
Ranunculus Ficaria	Jan. 22	...	Feb. 13	...	22 "
Narcissus tazetta	Jan. 30	...	Feb. 14	...	15 "
Cerintba aspera	Jan. 30	...	Feb. 12	...	13 "
Linum flavum	Feb. 6	...	Feb. 13	...	7 "
Tulipa oculus solis	Feb. 15	...	March 1	...	14 "
Muscari cornosum	Feb. 14	...	Feb. 28	...	14 "

The Iles d'Hyères, the ancient Stœchades, lie off the coast, and with the Presqu'île de Gien, help to

	Hyères.		Cannes.		Difference.
<i>Erica arborea</i>	Feb. 2	...	March 8	...	34 days
<i>Arisarium vulgare</i>	Jan. 27	...	Feh. 14	...	18 „
<i>Arum italicum</i>	March 10	...	April 5	...	26 „
<i>Iris germanica</i>	Feh. 15	...	April 11	...	24 „
<i>pseudacorus</i>	Feb. 15	...	April 11	...	24 „
<i>Helianthemum album</i>	March 30	...	April 5	...	6 „
<i>polifolium</i> ...	Feh. 28	...	March 15	...	15 „
<i>Gladiolus Germanicus</i>	April 12	...	April 15	...	3 „
<i>Borago officinalis</i>	Jan. 31	...	Feh. 14	...	14 „
<i>Vinca minor</i>	Jan. 17	...	Feh. 7	...	21 „

In order to judge better of these comparisons, I have compared the temperature of the two seasons at Cannes and other places; and although I find that the season of 1865 was, on the whole, colder than that of 1866, the difference of mean temperature in the month of February amounting to as much as 4° Fahr., yet the difference of the seasons is not, I think, sufficient to account for the striking contrast presented by Mr. Timins' table; more especially as the mean temperature of April, 1865, was actually 6° Fahr. higher than that of 1866. It will be seen that out of twenty plants, two flowered at Hyères a month and upwards earlier than at Cannes; six, three weeks and upwards; nine, one week and upwards.

Mr. Timins has also furnished me with a list of the principal species of Lepidoptera, and their time of appearance at the two places taken during the same seasons as the plants. It is here subjoined, as it may probably interest some of my readers.

Species.	Appeared at Hyères.	At Cannes.
<i>Papilio Machaon</i>	March 25	April 7
<i>Podalirius</i>	Feb. 26	April 8
<i>Thais Cassandra</i>	March 27	April 5

form the Rade d'Hyères. These islands are hilly and precipitous, and to a certain extent screen the

Species.	Appeared at Hyères.	At Cannes.
<i>Thais Medecicasta</i>	April 12 ...	April 10
<i>Rhodocera Cleopatra</i>	Feb. 13 ...	April 7
2nd brood ...	Oct. 29 ...	Oct. 10
<i>Rhamni</i>	March 31 ...	April 7
<i>Colias Edusa</i>	Jan. 29 ...	Jan. 27
myrmidone	Feb. 14 ...	April 10
<i>Colias Hyale</i>	Feb. 19 ...	March 12
2nd brood	Oct. 30 ...	None seen
<i>Aporia Cratægi</i>	April 25 ...	None seen
<i>Pieris Belia</i>	Feb. 3 ...	Feb. 7
Ausonia	March 6 ...	March 28
Daplidice	Feb. 5 ...	Feb. 4
Bellidice	Jan. 30 ...	Jan. 27
Cardamines	April 4 ...	April 12
Euphæno	April 8 ...	April 26
<i>Leptosia candida</i>	March 27 ...	April 17
Lathyri	Feb. 28 ..	April
Erysimi.....	April 15 ...	None seen
<i>Arge Psyche</i>	April 25 ...	None seen
<i>Satyrus Xiphia</i>	Feb. 17 ...	March
Egeria	March 28 ...	April 6
megæra	Feb. 2 ...	March 1
adrasta	None seen ...	April 26
<i>Vanessa cardui</i>	Feb. 8 ...	March
polychloros }	Feb. 8 ...	March 1
Io. }	Feb. ...	April
Antiopa }	March 17 ...	April 10
Atalanta }	Feb. 1 ...	Jan. 23
<i>Grapta C. album</i>	April 12 ...	April 10
Triangulum.....	March 11 ...	April 10

town of Hyères from the sometimes rather boisterous sea winds. Their appearance, as seen on a fine day from the Place des Palmiers, is strikingly beautiful; their fine outlines rising hazily from the blue Mediterranean, and forming an important feature in the sunny view enjoyed from that spot. On the largest island, Porquerolles, remarkable for the great size and fragrant odours of its shrubs, the French Government have established an Hospital for the invalid and wounded Algerine troops, thus giving a

Species.	Appeared at Hyères.		At Cannes.
<i>Limenitis Camilla</i>	April 12	...	May 7
<i>Melitæa Deione</i>	April 12	...	May 6
<i>Cinxia</i>	April 12	...	April 20
<i>Provencialis</i>	April 12	...	None seen
<i>Didyma</i>	April 25	...	None seen
<i>Dia</i>	None seen	...	April
<i>Argynnis Lathonia</i>	April	...	Feb. 7
<i>Thecla rubi</i>	Feb. 9	...	March 18
<i>Lycæna ballus</i>	March 17	...	None seen
<i>Hippothoë</i>	April 24	...	April 18
<i>Polyommatus Argiolus</i>	Feb. 28	...	April 7
<i>Hylas</i>	Feb. 27	...	April 6
<i>Melanops</i>	April 12	...	May 6
<i>Bæticus</i>	Oct. 29	...	Nov. 5
Spring brood ...	April 24	...	None seen
<i>Telicanus</i>	Oct. 29	...	Nov. 5
<i>Amyntas</i>	Oct. 30	...	None seen
<i>Battus</i>	None seen	...	April 26
<i>Hesperia alveolus</i>	March	...	April

practical proof of their opinion as to the mildness of the climate.

The east end of the town of Hyères is completely sheltered from the mistral by the Castle Hill, a spur of the Maurettes ; but the west end is open to its influence. Its force is broken by the mountains over Toulon, the Coudon and the Pharon, and its blasts are not quite so dry as at Marseilles, probably on account of the seaboard over which it passes before reaching Hyères. The town is protected from east winds by the chain of Les Maures : but it is affected by the south-east wind, which, as has been before stated, is sometimes irritating from the dust it brings up from the plain below. The Hôtel du Parc and the Hôtel d'Orient are situated at the east end of the town, and are therefore protected from the mistral ; the Hôtel des Iles d'Or and the Hôtel des Hesperides lie at the west end, and consequently are exposed to some of its gusts.

The mean winter temperature is $47\cdot3^{\circ}$ Fahr.—*i. e.* lower than that of Mentone, and not differing much from that of Nice. The average annual rainfall is twenty-seven inches—*i. e.* greater than that at Nice, and probably greater than that at Mentone. The amount of rainfall is curious, and contrasts with that of Toulon, which is eighteen inches, and doubtless

this difference, combined with a higher mean temperature, accounts for the great luxuriance of the vegetation in the neighbourhood of Hyères. The number of rainy days, according to M. de Valcourt, is sixty-three—*i. e.* less than that at Mentone or Nice: but the difference in the amount of moisture is best shown by the hygrometer. During the winter 1864-65, as has been before stated, the mean difference between the bulbs was $6\cdot7^{\circ}$ Fahr. at Mentone, while at Hyères it was 5° Fahr.

The climate of Hyères is the least exciting and the least stimulating of all health-resorts of this region. In fact, it sometimes has a sedative effect; for Dr. Griffith, the resident English physician, informed me that many patients coming from Mentone and Cannes in a state of nervous excitement and wakefulness, brought on by the stimulating effect of the air, have slept well and soundly at Hyères. This quality in the climate has its origin partly in its somewhat greater humidity when compared with that of Mentone, as seen above; partly in the luxuriance of the vegetation; and partly in the fact of the town being at some distance from the sea, and to a certain extent screened from saline breezes. Though not so perfectly sheltered from the mistral, nor enjoying so high a mean temperature as Mentone, the openness

and breadth of its valley give Hyères the advantage of a freer circulation of air, and of a larger space of level or gently sloping ground ; thus affording greater facilities for exercise in those cases where mountain climbing is unadvisable, and where drives or walks on level ground are preferable.

I must not omit to mention a sunny spot called Costabelle, lying one mile from the sea, and about a mile and a half from the town of Hyères. It is completely sheltered from the mistral by the Pic des Oiseaux, a spur of the Paradis range, and, according to M. Denis, enjoys a mean temperature two degrees of Fahrenheit higher than Hyères ; but its closer vicinity to the sea renders it more open to the southerly winds. The exotics growing in the villa gardens testify to the mildness of the climate ; and as it is a small place, and consists for the most part of detached villas, it possesses advantages in a hygienic point of view over most parts of the town of Hyères, where the houses are crowded, and the drainage arrangements by no means perfect.

Cannes, a town of 8000 inhabitants, may be reached in three hours by rail from Hyères, and in one hour from Nice. It is prettily situated, in the deepest recess of the gulf of Napoule, opposite the low islands, Les Lerins. The beautiful range of

the Estrelles protects it to a certain extent on the north-west side, and it is well sheltered to the north and north-east. To the east and south it is nearly entirely open. The mistral prevails here with considerable power, as the Estrelles only give partial protection to the town; and the east wind also enters the basin, and is of an irritating character, though less so than at Nice. Cannes is exposed to the blasts of all the southerly winds, as the islands, Les Lerins, are too flat and lie too near the sea level to afford efficient protection. The winter mean temperature is 48° Fahr.—*i. e.* lower than at Mentone, and higher than at Hyères. The average number of rainy days in the year is fifty-two, the smallest number in this region. The annual rainfall is twenty-five inches, the same as at Nice. (I have been favoured with some hygrometrical observations, diligently and carefully recorded by Mrs. R. Cocks, who has passed several winters there. As far as they admit of comparison with those of Mentone, they show Cannes to have a less dry climate.*) The vegetation is very rich, and of

* During the months of January and February, 1865, the difference between the bulbs was 4.8° Fahr. At Mentone Dr. Bennet's observations, taken during the same months, and at about the same hour of the day, showed a difference of 7° Fahr.

varied description, as seen in the villa gardens ; but the chief feature is the prevalence of scent-producing plants. Whole fields are devoted to the cultivation of the jessamine, cassia, and geranium, so that the air is redolent with these perfumes. Another fine feature of the vegetation is the graceful *Pinus pinea*, or umbrella pine, which is extremely abundant here, and attains to a very great size, probably from the favorable nature of the soil, which is of a sandy character.

The climate is warm, dry, and decidedly stimulating ; as might be expected from the situation of the town on the coast, and from the sandy and schistose nature of the soil. Cannes enjoys the advantage over Nice, of being less exposed to sudden changes in temperature, on account of its superior protection from northerly winds. The climate is nearly as stimulating, and contrasts greatly with the sedative qualities of that of Hyères.

Of the numerous and excellent Hotels which Cannes possesses, Hotels Imperial, Victoria, and des Princes, are situated near the sea. The Grand Hotel de Cannes and the Hotel Pavillon lie at a short distance from the shore, on the eastern side of the town ; and the Hotels de Provence, and de l'Europe, occupy still more inland positions on the

same side ; while at the west end, and in an elevated position away from the sea, are placed the Hotels Bellevue and Beausite. This end of the town enjoys greater protection from the cold winds than the eastern part.

Nice is a considerable town of some 40,000 inhabitants, situated on the Mediterranean coast between Cannes and Mentone. It faces the south, is built on a plain, formed probably by the deposits of the Paillon torrent ; and is surrounded, except on the seaboard, by an amphitheatre of mountains. This plain runs back from the sea to the distance of three miles and upwards ; but laterally it occupies a far greater space. The protecting amphitheatre of mountains consists of spurs of the Maritime Alps, forming a succession of ranges, of which the nearer ones are low wooded hills, pleasantly besprinkled with villas, while the more distant are lofty and bare. The higher chain of mountains does not afford by any means complete shelter to the town, partly on account of its distance, and partly on account of various gaps and depressions in the range. The chief gap in the Nicean amphitheatre is to the north-east, and is caused by the wide valley of the Paillon, a torrent, which flows down from the snows and glaciers of the Col de Tende, and dis-

charges itself into the Mediterranean at Nice. The *bise*, or north-east wind, reaches Nice through this valley, and is very cold and cutting. The *mistral* comes through a depression to the north-west, and is more felt here than at any of the four health-resorts. The east wind prevails in March, and is dry and of an irritating nature; and all the southerly breezes blow unchecked by obstacles of any sort. The mean winter temperature is, as has been stated before, 47·8° Fahr. The average rainfall is twenty-five inches; and the average number of rainy days, sixty.

Cimiez and Carabaçel are suburbs of Nice, and from their situation enjoy a much greater amount of protection than the town itself. Cimiez is placed on the slopes and near the summit of one of the low ranges to the north of Nice, while Carabaçel lies immediately at its foot. Carabaçel is upwards of a mile from the sea, is nearly entirely protected from northerly winds by the hill of Cimiez, and but slightly influenced by southerly and easterly breezes. Cimiez is further still from the sea, and enjoys equal protection; and in both these places the vegetation is very luxuriant, and exotics of varied description flourish in the open air.

The climate of Nice itself is warm, very dry, and rather stimulating; but its chief defect lies in its

liability to sudden and rapid changes of temperature, which arise from its imperfect protection from northerly and easterly winds. When snow falls on Mount Chauve, a mountain to the north of Nice, and the wind blows from that quarter, a bitter state of atmosphere is experienced in the town. Although the uncertainty of climate precludes Nice from being suitable for the majority of pulmonary complaints, the absence of moisture, and the combination of bright sunshine and saline breezes, render it eminently suitable for rheumatic and gouty affections, as also for the atonic forms of dyspepsia and for many scrofulous complaints.

The climate of Carabacel and Cimiez presents a decided contrast to that of Nice, and some similarity to that of Hyères, being less exciting, less liable to sudden change, and moister than that of Nice. The hygrometrical observations, taken at the military hospital near Carabacel, show the amount of moisture to be nearly the same as at Hyères; and several medical friends have informed me that this climate exercises the same sedative influence on patients coming from Cannes and Nice itself, as Dr. Griffith states is exercised by the climate of Hyères. This decided contrast to the climate of Nice, displayed by its suburbs, is to be accounted for by their distance

from the sea, by their large amount of vegetation, and by their superior shelter from all winds. Pulmonary invalids may therefore find a safe refuge in these localities, if they are content to remain within their bounds. But this is too often not the case: they complain of being dull and moped in the quiet retreats of Cimiez and Carabacel; and, tempted by the attractions and promenades of Nice, they encounter the sudden changes and chills which are so prejudicial to such cases, and may frustrate all the objects for which they have left their native land.

The Hotels Victoria, Méditerranée, Grande Bretagne, Angleterre, and des Anglais, are close to the sea. The Hotel de France and Hotel Chauvin are on the right bank of the Paillon, at a short distance from the shore; while in sheltered positions at a considerable distance from the sea are to be found the Hotel Royal, and the Hotel de Louvre in the Rue Grimaldi, and the Pension Milliet in the Rue St. Etienne. At Carabacel the Hotels de Nice and Paris, and at Cimiez, the Pension Garin, are tolerably protected from cold winds. The railway ends for the present at Nice; and a four hours' drive along a road, which rises at the Turbia to a height of 2200 feet, and abounds in exquisite views of the coast line, brings us to—

Mentone, a town of 5000 inhabitants, situated twenty-two miles east of Nice, and close to the Italian frontier. It is beautifully placed at the foot of some wooded hills, backed by the Maritime Alps, which here rise to the height of 3000 or 4000 feet, and form a semicircle, completely protecting the town from all northerly winds. A fine bay, bounded on the east by the Murtola Point, and on the west by the Cape St. Martin, is divided into two smaller ones, the eastern and western bays, by a peninsula, on which the town of Mentone stands. A number of small valleys run back from the town towards the protecting range; and it is in these, and in the gardens immediately behind Mentone, that the vegetation is so very luxuriant, and that the lemon-tree attains a degree of perfection unequalled elsewhere in France. The fruit falls off the branches if the temperature sinks to 27° Fahr., and the tree itself is killed at 24° Fahr.; so that the appearance of this tree furnishes a tolerably fair indication of the thermometrical changes taking place. Olive and carob trees grow to a great size, and are very productive. The houses occupied by visitors are built for the most part close to the sea, and though a few villas have been erected away from it, the short distance, that intervenes between the sea and the protecting ranges, will prevent a large number

being built, except in the immediate vicinity of the sea.' I will not enter into a fuller description of this beautiful and well-protected spot, which has had full justice done it by Dr. Henry Bennet in his charming work on 'Winter in the South of Europe,' and by Dr. Siordet and many other authors. Mentone is completely sheltered from all northerly winds, including the mistral; but it is open to the east wind, and to all the southerly breezes, including the sirocco, which is, perhaps, the only objectionable wind that visits this town, and causes a very close state of atmosphere, when it has been blowing for some days. The mean winter temperature is 49.5° Fahr. (Bennet), 48.5° Fahr. (Valcourt), the highest in this region. The average number of rainy days is eighty, and the rainfall is said to be greater than at Nice. The hygro-metrical observations of Dr. Bennet, as cited above, for the winter 1864-65, show Mentone to be the driest of all the four localities where registered hygro-metrical observations are kept.

The climate is warm, very dry, and stimulating. It is also very equable, being much less liable to sudden changes of temperature than Nice or Cannes. There is a want of circulation in the atmosphere, particularly of the eastern bay; and the close proximity of most of the houses to the sea subjects patients

too much to the noise and stimulating effects of that element.* It is generally considered that of the two bays the eastern is the warmer ; but some careful observations made by Dr. Franks during last winter and spring showed the mean minimum temperature ($48\cdot3^{\circ}$ Fahr.) of the western was slightly higher than that of the eastern ($47\cdot7^{\circ}$ Fahr.). Dr. Bennet informs me that Dr. Franks's observations were taken in an extremely sheltered part of the western bay, and would not apply to the bay generally.

The principal hotels—Hotel Victoria, d'Angleterre, d'Italie, de la Paix, Turin, and the Pension Anglaise, &c., are situated near the sea, and there is, unfortunately, a lack of hotel accommodation in positions at a distance from the shore.

We have now reached the frontier, and in our next chapter we will consider the effects of the French southern climate on health and disease.

Its physical aspects have been examined, and it has been shown that the climate is warmer and drier

* This defect in Mentone may some day be supplied by Rocca-bruna, a well-sheltered village, affording some accommodation, and situated 800 feet above the level of the sea, three miles from Mentone, on the Nice Road. My father, Dr. C. J. B. Williams, pointed it out to me as one of the warmest spots on the Riviera, during a tour which we made together through this region in 1856.

than our own ; that it has more sunshine, and counts fewer rainy days, and therefore gives greater opportunities for out-door exercise ; and it is doubtless the principal recommendation of the South of France as a winter resort, that it affords facilities for out-of-door exercise in a pure, mild, and invigorating air, comparatively secure from the chills, changes, fogs, and wet or bleak weather, which pretty generally prevail in this country.

In reviewing the several localities in reference to their facilities for this health-giving exercise, Hyères and Cannes may be named as those which afford the greatest extent of sheltered rides, drives, and walks available for invalids. In the former place there are wanting only improvements in the roads and in the character of the vehicles to excel the other places in these respects. Cannes, with better roads, and a somewhat better supply of carriages and horses, does not enjoy an equal amount of shelter ; but even in this point it surpasses Nice, which, with all the choice of equipage belonging to a large town, and with all the enchantment which beautiful scenery can give to its environs, has the disadvantage that in some of its beautiful drives the traveller may experience an excessive fall of temperature in the course of a few minutes. Mentone enjoys the protection of being

almost hemmed in by mountains ; but it thereby loses the advantage of numerous level walks and drives suitable for many invalids. It is, therefore, best adapted either to infirm patients who require a warm atmosphere with little locomotion, or to those much stronger and more active, who, on foot or on donkeys, can scramble up its mountain valleys.

CHAPTER IV.

MEDICAL ASPECTS—EFFECTS OF THE CLIMATE ON HEALTH AND DISEASE.

THE testimony of all the medical men practising among the natives is to the effect that, though acute disease occurs often, and is very fatal, chronic disease is rare; and many forms of degenerative diseases common in this country are scarcely known there. Dr. Griffith informs me, that no cases of Bright's kidney disease have occurred in the Hyères hospital within the memory of the present medical officers; and I may mention that Dr. Francis gives somewhat similar testimony concerning the hospitals of Spain: for he states that after carefully examining the principal hospitals of the Spanish peninsula for cases of this disease, he only succeeded in finding a few at Carthagen. I regret that I have been unable to collect statistics to decide the per-centage and mortality in each class of disease. Dr. Bennet states that the deaths from pulmonary consumption at

Mentone are only one in every fifty-five of the total number, instead of one in five, as at Paris and London.*

Dr. Chambers, in his admirable Lectures on the Climate of Italy, has drawn attention to the registered mortality of Genoa, a city enjoying a climate much resembling that of the south of France, though liable to greater changes; and he has compared it with the registered mortality of London for the year 1862. Allowing for differences of nomenclature in the two registers, Dr. Chambers shows that, of the total number of deaths, the proportion from chronic disease is smaller at Genoa than at London—c. g. at Genoa it is 1 in 5·6, whereas at London it amounts to 1 in 3·2. He cites the following striking instances:—Anasarca, or general dropsy, caused 1 in 93 deaths at London; 1 in 239 at Genoa. Chronic affections of the respiratory organs, including asthma and bronchitis, but excluding pulmonary phthisis, caused at London 1 in 10 deaths; at Genoa 1 in 20. Aneurysm at London caused 103 deaths in the year; at Genoa none. Chronic disease of the heart caused at London 1 in 27 deaths; at Genoa 1 in 33. No deaths from nephria, or kidney disease, were regis-

* One in eight is the mortality from phthisis, according to the 'Registrar-General's Report for 1862.'

tered at Genoa, but probably some were included under deaths from anasarca.

Dr. Chambers remarks that the more decidedly chronic and degenerative the disease is, the more marked is the difference between the two cities. On the other hand, the registers show the proportion of deaths from acute disease (excluding zymotics) in Genoa to be more than double that of London—i. e., at Genoa 1 in 3·3; in London 1 in 7·7 deaths. Acute affections of the respiratory organs caused in Genoa 1 in 9 deaths; in London 1 in 16. Acute affections of the intestinal canal (including enteritis, gastritis, diarrhœa, and dysentery) caused in Genoa 1 in 8·9; in London 1 in 30·3 deaths. Acute affections of the nervous centres caused in Genoa 1 in 59; in London 1 in 119 deaths. Apoplexy and cerebral congestion caused in Genoa 1 death in 12; in London 1 in 40. Acute inflammation of the heart caused in Genoa 1 death in 44; in London 1 in 606.

These comparisons are very striking; but it must be allowed that the force of them would be greater if we could be quite certain that the diagnosis of disease is as accurately carried out at Genoa as it is in London. The entire absence of deaths from aneurysm seems almost improbable among an industrious population, a large number of whom are en-

gaged in the laborious task of lading or unlading heavy ship cargoes, and in other occupations which exercise a decided strain on the vascular system. The high rate of mortality from acute disease of the respiratory organs is owing, probably, to the sudden atmospheric changes to which Genoa is peculiarly liable, on account of its unprotected position; and in this respect the health-resorts which we have been considering enjoy a great superiority over the Italian city.

The general effects of the climate of the south of France on patients may be divided into negative and positive.

Negative.—e. g. The avoidance of the exciting causes of so many diseases—namely, cold and damp. Many invalids, particularly those suffering from phthisis, asthma, emphysema, and chronic bronchitis, by simply avoiding catching fresh colds, prolong life and escape much suffering.

Positive.—e. g. The stimulating influence of the air, and the abundant out-door exercise which can be taken in this region. The functions of digestion and assimilation are improved, the standard of nutrition is raised, healthy tissue is formed, and morbid deposits are absorbed and eliminated. This stimulating character of the air is to be referred partly to the saline breezes coming from one of the

saltest seas known, and partly to its dryness. The effect of this last quality on the skin is remarkable; for it might be thought that perspiration is promoted by a dry atmosphere more than by a moist one; but it is really found that an arid state of the skin checks the superficial circulation and secretion, and that a certain amount of moisture in the atmosphere considerably increases the amount of sensible perspiration. In the south of France it takes a great deal to make one perspire, as I have myself experienced. This bracing effect of the climate is well seen in the cessation of the nocturnal sweats of phthisical patients, who, after a time, only perspire like other people—viz. during exercise. This dryness sometimes amounts to a hurtful excess; and I have known patients suffering from dry bronchitis, who have been obliged to add to the moisture of their apartments by hanging damp sheets in them, or by the diffusion of steam from hot water. It is probably to the stimulating quality of the air that the want of sleep so common among visitors is due. Patients seldom sleep so soundly as in England, and often for only a few hours of the night. Many take a siesta in the day. But evil results seldom follow from this wakefulness; for the nervous system, as Dr. Chambers remarks, being in a healthier condi-

tion, seems to require less repose, and refreshes itself more rapidly. This stimulating quality, which is to be found to its greatest extent near the sea, does absolute harm to patients already suffering from an excited state of the nervous and vascular systems; as in cases of hyperæsthesia, cerebral erethism, gastritic dyspepsia, and of inflammatory and feverish affections generally. Such patients ought rather to avoid the Mediterranean region of France; or, if they should go there, they should choose the inland climates of Cimiez and Hyères in preference to those nearer the sea.

Some information with regard to giving a preference to some of these localities over others for certain forms of disease may be acceptable, and I will now state the results of my inquiries and experience on this point. It has been my object to show that the climate of the individual health-resorts depends on their proximity to, or their distance from, the sea; that the air of the places immediately on the coast is exciting, while that of the more inland is less stimulating and softer: and it is on these differences that the selection of a locality should be based. In cases of bronchitis the type must be borne in mind. If it be humid, accompanied by free expectoration, and devoid of febrile symptoms,

Cannes,* Mentone, or even Nice, would be suitable. If it be dry, and attended by inflammatory symptoms, the softer climates of Hyères and Cimiez would be preferable. As regards spasmodic asthma, Dr. Bennet says that some cases do well at Mentone, but the majority do not derive benefit. This may be accounted for by the closeness of the Mentonian atmosphere. Cannes does not always suit this disease, according to Dr. Battersby; but the climate of Hyères has answered very well for many such cases. Cases of emphysema, in which the avoidance of bronchitis is necessary, do well at any of the localities except Nice. In pulmonary phthisis, as in bronchitis, the type must be taken into consideration.

Cases of non-inflammatory phthisis in all stages, except the last, derive marvellous benefit from the climate of this region. For these Cannes, Mentone, Hyères, and the suburbs of Nice are suitable; Nice itself, on account of its sudden changes of temperature, is less safe.

* Cannes answers particularly well when the amount of expectoration is in excess of the patient's strength, as in bronchorrhœa of the aged. Dr. Whitely, of Cannes, informs me that the climate is very effective in stopping any discharge of the nature of a flux, and arising from a relaxed state of system, unaccompanied by inflammatory symptoms.

The inflammatory form, accompanied by fever and gastric irritation, is better at Hyères or Cimiez. Dr. Battersby does not recommend Cannes for such cases. According to Dr. Siordet, the effect of the Mentonian climate in these cases is to bring on hectic fever and to hasten the fatal termination.

The Mediterranean climate generally, is, I think, too dry and stimulating for this form ; and a moister, softer atmosphere is desirable. Such can be found, although at a sacrifice of warmth, in some of the British watering-places, e. g. Torquay, Ventnor, Bournemouth, &c., where saline breezes are combined with a lower mean temperature and a considerably greater amount of moisture. Should the large number of wet days and the prevalence of wind in these localities during the winter months, present objections, the drier and remarkably still atmosphere of Pau may prove more beneficial. It may be well to direct our attention for a short space to this interesting climate.

Pau is eighteen hours distant by rail from Paris, and stands on a terrace of gravel at an elevation of 150 feet above the river. It faces south towards the Pyrenees, distant about twenty miles, and overlooks a rich valley through which the clear Gave flows. According to

Sir Alexander Taylor, "it is protected on the north by the Landes of Pont Long, which ascend very gradually to the distance of eight miles from Pau. The north wind is thus directed into currents, which being attracted by the lofty mountains to the south, pass at an elevation considerably above the town : so that the clouds may be often seen quickly sailing onwards, when the leaves are unmoved on the lower level." The town is to a certain extent screened from the north-west and west winds, but it is open to the southerly and easterly breezes. The chief feature of the climate is the wonderful stillness of the atmosphere. The leaves of the trees scarcely move, and the rain descends almost perpendicularly ; and even when the wind does blow, its gusts are of short duration, and of no great force. Sir A. Taylor states that during a period of six months' observations the presence of wind was recorded only 13 times. The mean winter temperature is 42·8 Fahr. 5° Fahr. lower than at Nice ; and snow falls occasionally. The average rainfall is 43 inches compared with 25 at Nice ; and the average number of rainy days is 119, compared with 60 at the latter place. My friend Dr. Bagnall has kindly forwarded the hygrometrical observations for the last two winters, and, on comparing them with those of Nice

and the other Mediterranean resorts, I find that during the winter 1865-66 the average difference between the bulbs amounted to 2.7° Fahr. at Nice, and to 2.4° Fahr. at Pau, the Kew difference for the same period being 1.65° Fahr.

The hygrometrical results for the winter 1866-67 at Nice and Pau tallied with those of the preceding year, but the month of March, 1867, presented a marked contrast at the two places.

At Nice the average difference between the bulbs was 2.3 Fahr. while at Pau it was 4.2 Fahr. ; so that during this month Pau actually enjoyed a drier climate than Nice. This was probably exceptional.

When we consider the large amount of rain that falls at Pau, and the prevalence of moist westerly breezes, it is rather surprising that the hygrometer should not indicate a greater amount of humidity during the winter, and the phenomenon can only be accounted for by the absorbent nature of the gravelly soil on which the town stands, and the natural "draining" of the place by the Gave stream. The calmness of the atmosphere, combined with a certain degree of moisture, imparts a sedative quality to the climate, which acts beneficially on the inflammatory type of phthisis, and Pau can be recommended for this form of disease. The number of rainy days,

and the decidedly cold and cloudy weather to which Pau is at times subject, prevent the same freedom of exercise which can be taken in the more southern region, and which is of great importance to a large number of pulmonary invalids; but in fine weather Pau has the recommendation of a large choice of beautiful drives, which cannot be said of all the Mediterranean resorts.

In our brief notice of the claims of different localities as a winter residence for pulmonary invalids, we must not omit the mention of Madeira, as one which was long supposed to stand foremost in the list. In the last few years this island has not maintained its place in the favour of the profession or of the public; and its comparative desertion has been ascribed by a recent writer to its "seeming rather to satisfy the requirements of the bygone period of the professional mind, when pulmonary consumption was considered a species of inflammatory disease, than to satisfy present requirements," when "phthisis is considered a disease of debility, of anæmia, of organic exhaustion, and of defective nutrition." Now, although we may admit that the advance of pathology has thrown light on both the nature and treatment of consumptive diseases, we can hardly allow that there

is such a change in the “professional mind” as to deny altogether to inflammation any share in producing or aggravating these maladies. It is still the opinion of those who have had the largest experience, that a considerable number of cases of phthisis take their origin from inflammatory attacks; that intercurrent inflammations are the most common causes of acceleration of the disease in this country; and that a climate which supplies fresh air without cold, damp, and sudden changes, owes much of its salutary influence to its excluding these causes of inflammation. The declining popularity of Madeira may be attributed partly to its distance from England, and its isolation, involving the necessity of an irksome sea voyage, and removing the patients so far from friends and home; and partly to a temporary cause—the establishment of a quarantine—which, in latter years, proved a most serious obstacle to the reception of invalids. From recent information it must be added, that the climate of Madeira is deteriorated in its salubrity, in consequence of the substitution of the sugar-cane for the vine, since the ravages of the oïdium have destroyed the productiveness of the latter. In the cultivation of sugar-cane constant irrigation is required, which keeps the ground in a damp state; and the evil

effects have already become manifest in the prevalence and mortality of fever in the island. Even before this change took place the air of Funchal was never healthy; and for many years my father's experience led him to the conclusion that patients rarely benefited much by wintering in Madeira, unless they were strong enough to ride daily on the mountain roads above the town.

The climate of Funchal and the neighbouring country is remarkable for its steady mildness throughout the winter, being exempt from sudden changes, and from wind, except to a very limited extent; and it counts few rainy days: but the air contains a considerable quantity of aqueous vapour, which imparts to it a softness, highly beneficial in the inflammatory type of consumption, but relaxing and enervating for other forms, and even for healthy persons. It may therefore be said generally, that Madeira is best suited for the early stages and inflammatory forms of the disease, and is not likely to benefit those in whom the cachexia or degenerative tendency is well marked.

It may not be out of place to notice the experiment which was lately made, by the Committee of the Hospital for Consumption at Brompton, in sending twenty patients, selected for the purpose, to

Madeira, for the benefit of the climate in winter. The result was by no means so favorable as had been anticipated: not more than three out of the number returned in an improved condition. One died in the island; and the others generally lost flesh and strength; and the disease in them made considerable progress. It must be added that these patients, although well fed and cared for, had little or no medicine administered to them, and they thus show that the climate alone, unaided by cod-liver oil, tonics, and other aids in treatment, is truly of inferior efficacy.

CHAPTER V.

HYGIENICS OF CONSUMPTION—FOOD—CLOTHING— VENTILATION—EXERCISE.

A FEW remarks on the hygienics of consumptive patients will not be out of place ; comprising hints with respect to food, clothing, ventilation, and exercise in this region ; as these may aid the beneficial influence of the climate, and considerably increase the probability of the patient's recovery.

Food.—As might be expected in a country devoted to the culture of the olive, vine, orange, and lemon, there is a scarcity of pasture for sheep and cattle ; and consequently meat is neither so abundant nor so good as in the grazing countries of the north. It often has to be brought some distance, and is seldom really tender. Added to this, the cooking, except in the best hotels, is not of that plain wholesome character which best agrees with the delicate appetite of an invalid ; and often contains a large amount of grease

and oil, which in a warm climate tends to produce biliousness and liver disturbance. By strict injunctions to the cooks, this objectionable quality in the food may be corrected, and a tolerably wholesome diet procured, and it is of the utmost importance that this point should receive due consideration; for not only may inattention to it induce bilious derangements, but it may prevent the regular and sufficient administration of cod-liver oil, which is the most potent of all means to promote recovery in phthisis. It is mainly through want of attention to this point, that an impression prevails with many practitioners in the south, that patients cannot take the oil in warm climates. But we now have the best evidence, that not only in the South of France and Italy, but in Madeira also, and even in India, this remedy can be given regularly and freely with excellent results. A patient will find that the two daily doses of the oil, with the butter eaten at meals, will be as much, in the way of fatty matter, as his digestive powers can manage in this region, and any extra supply in the form of rich dishes will only disagree. If he avoids these, and only remembers to take the oil *immediately after* meals, he will be able to continue its use through the winter, and will gain flesh and strength thereby. The bread is tolerable, and the

butter excellent ; but the latter is not the produce of the country, being imported from Milan and other distant places.

The vegetables of this region are abundant and in perfection. Their variety, their profusion, and the rapid succession of their crops in winter cause considerable surprise to visitors. They are astonished to find themselves eating new potatoes in January, and deliciously tender asparagus in March ; while all through the winter they can depend on an abundant and constant supply of green peas, dwarf beans, cauliflowers, brocoli, and artichokes, all excellent in flavour and quality. The artichokes are particularly tender, and the cauliflowers of very fine growth. But it is in the form of fruit that we see the effect of that bright sun, those clear skies, and that genial soil, most marked. Nature, aided but little by Art, pours forth a bounteous feast of oranges of various kinds and sizes, of lemons sweet and acid, of shaddocks, pomegranates, almonds, apples, and pears.

The Japanese medlar, a tree very sensitive to the slightest degree of frost, bears a delicious and highly prized fruit ; and dates are produced from the palms ; but it must be confessed they are hardly catable. The oranges of Nice are particularly refreshing to the invalid in this warm climate, and the fragrant

odour of their rind is only equalled by the sweetness of their taste. These and many other fruits the invalid can enjoy throughout the winter ; and provided that he does so in moderation, he will suffer no injurious effect from them.

With regard to alcoholic beverages, it may be stated that the stimulating influence of the climate considerably diminishes the necessity for their use. Spirits and the stronger wines, port and sherry, are quite out of place. As Dr. Chambers justly observes, "one does not feel to want them. A single glass of Orvieto or Capri there seems to produce as much exhilarating relief as an allowance of the domestic port and sherry containing five times the quantity of spirit." The same influence is to be taken into account in prescribing medicines. The strong tonics are as a rule to be avoided, and the milder ones substituted.

Clothing.—This region owes much of the warmth of its winter climate to the prevalence of sunshine ; in which one may bask with all the sensations of a fine English summer : but cloudy days and even shady places have their chilly influences, against which the patient should be protected by always wearing a flannel or merino underdress. This is especially required in driving in an open carriage ; and the more

so, early in the morning, or late in the afternoon; when invalids should be provided with a shawl or overcoat. Light-coloured suits of thick texture are the most suitable; as, while sufficiently warm to prevent the differences of sun and shade being felt, they do not absorb the sun's rays so much, nor present so sorry a figure under the influence of dust, as the darker ones. The light-coloured parasol with a dark lining is useful to protect the head from the sun's heat, and the eyes from its glare; and is freely used not only by ladies, but also by gentlemen, who are wise enough not to allow the effeminacy of the proceeding to prevent their experiencing its comfort. The great object to be aimed at in clothing is to render the body independent of slight changes in the temperature resulting from alternations of sun and shade, and at the same time to protect the head from the evil effects of powerful sunshine; for in this climate sunstroke is far from uncommon, although it is easily guarded against by the above precautions.

Ventilation.—Whilst we fully admit the importance to a consumptive patient of pure air and its abundant supply, to improve the assimilative and nutritive powers, to raise the standard of products, to facilitate the formation of healthy fibrin and albumen, and to prevent the production of degraded tissues, as tubercle;

in short to remove the tuberculous cachexia,—we must not overlook certain conditions necessary to ensure its full and beneficial influence. The pure air must be of a certain temperature, or at any rate within a certain range, otherwise the alternations of heat and cold will induce fresh attacks of catarrh, bronchitis, pulmonary congestion, and possibly pneumonia, any of which complications may considerably aggravate the original disease. The practice of sleeping with open windows, sometimes recommended to consumptive patients, is a very questionable one. It is questionable during summer in England, where there is less variation of temperature, owing to the influence of the large quantity of aqueous vapour present in the atmosphere, which reflects back to the earth the heat lost by radiation, and thus prevents a great fall of temperature. Even with this equalising influence of the British climate, the coolness and dampness of the night air in summer is often sufficient to induce chill of the body and its sundry evil consequences. But in the south of France the practice is doubly hazardous; for here, during the winter, the fall after sunset is rapid, and the diurnal range very considerable; owing, as I explained in the commencement of this work, to the amount of moisture present in the atmosphere being small, and the

effects of radiation in a clear sky being unchecked. The temperature may be that of summer at noonday, and towards midnight it may fall to 40° Fahr.; and it is this change, that is a fertile cause of bronchitis, pleurisy, and pneumonia in consumptive cases. Apart from the general chill of the body, which may sometimes be obviated by an abundant supply of blankets and coverings, the local effects on the lungs produced by the changes in the air are of some importance. Against these nature has to a certain extent provided a safeguard in the nasal passages, where a large and tortuous plexus of veins furnishes an apparatus for warming the air previous to its entry into the lungs. The mouth, however, is not equally well armed, and air entering by that passage is not so likely to be raised to the proper temperature for respiration, as the portion which passes through the nose. Many persons sleep with their mouths open, and breathe almost entirely through them, and in these the inspired air loses the warming influence of the nasal passages. How common it is for even healthy persons, after sleeping with their bedroom windows open, to awake the next morning with a slight cold in the head. This, in the case of the strong, passes off in the course of a few hours, but in pulmonary invalids, may lead to further mischief.

One of the great objects in the treatment of phthisis being the avoidance of all secondary complications, it is evident that the patient should be protected from this injurious influence as much as possible, and it is better for him to be kept too warm than too cold. He will have full opportunities in the daytime to enjoy a pure and warm atmosphere, and if the air of his bedroom at night be not so fresh and pure as that which he has been breathing in the day, he can console himself that it is far better to inhale it, than to subject his frame, especially in a dormant state, to all the variations of night temperature. After all, it must never be forgotten that cold is a greater evil than heat, especially in lung complaints; and it is wiser therefore, after airing the bedroom with widely opened windows in the day, to close them at night-fall, and to trust to the chimney and to an occasional fire for ventilation.

Exercise.—It may be broadly stated that in all cases of phthisis, exercise in some form or other is beneficial; but whether it should be of the active or passive kind, and what varieties of each are admissible, depends on the stage and type of the disease, and also on the strength of the patient. In the early stages, where the symptoms are not active, where there has been no recent blood-spitting, and

where the cough is not hard or frequent, those varieties of active exercise are of most advantage which most effectually expand the upper portions of the chest, thereby bringing into play the upper lobes of the lungs, so generally the seat of tubercle; and, by causing the blood to circulate freely through the pulmonary tissue, thus prevent local congestions and fresh deposits, and aid materially in the absorption of old ones.

What are the varieties of exercise which best accomplish this end? Those in which the upper extremities are raised, and the muscles connecting them with the thorax brought into activity. When the arm is raised, the numerous muscles which arise from the ribs, and are inserted into the bones of the upper extremity, *e.g.* the pectoralis major and minor, the subclavius, the serratus magnus, &c., in contracting, raise the upper ribs, and thus increase the size of the chest cavity. This necessitates the inspiration of a larger amount of air. Dr. Silvester has called attention to this important principle, and on it has founded his excellent system of restoring respiration in cases of drowning, narcotism, &c. He has also recommended a modification of it in the incipient stages of phthisis. The forms of exercise which carry out this principle are—rowing, particu-

larly the pull and backward movement, the use of the alpenstock in mountain ascents; swinging by the arms from a horizontal bar, or from a trapeze; climbing ladders or trees. Dumb-bells as commonly used, are calculated to develop the arms more than the chest; and rather tend to depress the latter, by their weight. Various special gymnastic exercises, of which there is a great choice and variety nowadays, may more or less answer the purpose; but there is one form, which is particularly applicable to the object above mentioned, viz. the *gymnast*, invented by Mr. Hodges, 89, Southampton Row. But, to make this instrument answer the purpose of a chest elevator or expander, it should be fixed, not as usually done, at the height of the operator, but considerably above his head, in or near the ceiling, with the handles reaching down about to his shoulders; then by holding the handles, and walking a few paces forwards and backwards, the arms are brought into a species of action, which, while it exercises the whole body, especially tends to expand and elevate the upper part of the chest.

Walking exercise, as a rule, does not work the upper extremities, or raise the upper ribs, but acts generally on the system, by drawing the blood to the extremities, and quickening the circulation through

the lungs. In mountain ascents, and in fast walking, the quickening of the circulation brings the whole lungs into play ; and in this way the upper lobes come into full use. If the alpenstock be used in mountain climbing, the beneficial local effects of raising the upper ribs, may be combined with the general advantages of walking.

Walking exercise can be taken in all stages of phthisis, provided there be no active symptoms present. Even where cavities are formed, if there be no recent inflammation, a limited amount, and performed on level ground, is beneficial ; but great care must be taken not to overtax the patient's strength.

Passive exercise may be used by the weak and delicate, even in advanced stages of phthisis, or when it is of the inflammatory type. Open carriage exercise, sailing, or being rowed in a boat, are instances, in all of which little muscular exercise is involved ; and they may be considered as means of supplying a constant change of air, with the least fatigue, while their effect in improving the circulation and appetite, and in promoting sleep, is often very apparent. But even these make some demand on muscular and nervous power, and must not be carried to the extent of producing exhaustion in weak subjects. The roughness of many of the roads,

and the not always luxurious construction of the carriages in the south, sometimes invalidate the distinction between active and passive exercise. Riding may be considered intermediate between the two forms, for rapid paces, and even the management of a high-mettled steed, may well be classed as active exercise; but the general mode of equitation in the south, on donkeys, mules, or very quiet ponies, hardly rises above the standard of passive exercise.

From the time of Sydenham, horse exercise has always been acknowledged to be peculiarly beneficial to those pulmonary patients that can bear it; and any one who closely studies the effect of the motions of riding, on the respiration, may perceive that there is a remarkable relation between the process of breathing, and the paces of the horse. This, in addition to the inspiriting effect of the air and exercise, may have its share in the salutary results.

CHAPTER VI.

WINTER STATIONS OF ITALY—BORDIGHERA—SAN REMO
—NERVI—PISA—ROME—CAPRI—SALERNO—AMALFI.

IF after quitting Mentone we cross the Pont St. Louis and enter Italy, we shall find along the beautiful Riviera route several localities, sheltered from cold winds by the Maritime Alps, and enjoying the full effects of the sun's rays and the Mediterranean sea.

These localities, though not as yet, with the exception of San Remo, equal in point of accommodation to the French health resorts, are rapidly developing their resources; and with regard to position, have already proved to be safe wintering places for many pulmonary invalids. As it is advisable that this class should have a large selection of southern refuges from northern winters, I propose in this chapter to mention briefly some of the more sheltered spots of Italy; regretting much that, through lack of meteorological data, I cannot speak with certainty as to the climate in every case.

Bordighera lies about eleven miles from Mentone, on a promontory jutting far out into the sea, from which exquisite views are obtained of the coast as far west as the Estrelles. The splendid palm-groves, descending even to the shore, and containing trees upwards of 1000 years old, form the chief feature of the scene, and testify powerfully to the warmth of the climate. According to the observations of the Rev. A. Craig, the English chaplain, for which I am indebted to Dr. Daubeny, of San Remo, the mean temperature, during the months of January, February, and March, 1867, was lower than that of San Remo; but the daily range was less. The hygrometrical observations taken at 9 a.m., showed a difference of 2·8 Fahr. between the bulbs, as compared with 2·4 Fahr. at Nice for the same period.

The Hôtel d'Angleterre is good; and invalids have passed the winter in it with tolerable comfort to themselves, and benefit to their health.

San Remo, a town of 11,000 inhabitants, about three and a half hours' drive from Mentone, rises like a white pyramid from the shore of the Mediterranean; contrasting strongly with the sombre colour of the vast olive-grove, which extends for miles in its neighbourhood, covering the nearer range of hills, forming the principal feature of the scenery, and con-

tributing, by its produce, in no small degree to the prosperity of the town. The protecting range, sloping gently back from the shore, is intersected, but not penetrated, by numerous valleys remarkable for the luxuriance of their vegetation, and running out on either side to the sea, forms the capes San Remo and Verde, which end precipitously, and enclose a fine bay four miles in width. The nearer and olive-clad chain is backed by one more lofty, which rises in parts to the height of 7000 feet, and on which the vegetation is less abundant and more hardy, including varieties of the pine and oak. The town itself faces south, and is built on a spur of the nearer range, with a valley on either side. It is tolerably well sheltered to the north, north-east, north-west, and east; but it is exposed to all the southerly winds, including the south-east.

Lemon-trees abound, and, from their thriving state and the size of their fruit, show how rarely frost occurs. Palms are to be seen, and the olive oil produced is of excellent quality. Villas are sprinkled over the hillsides in beautifully sheltered positions; and some of the hotels (Hôtel de Londres, and Hôtel d'Angleterre) are well placed; being outside the town, and removed from the disagreeables of noise and bad drainage.

The mean temperature is $49\cdot1^{\circ}$ Fahr. (Sigmund) : nearly as high as Dr. Bennet's estimate of that of Mentone, and it would appear from a comparison of the thermometrical tables kept by Dr. Daubeney, one of the resident English physicians, with those of Dr. Bennet for the same winter (1864-65) at Mentone, that the mean range of temperature is much less at San Remo. At Mentone it amounted to $12\cdot6^{\circ}$ Fahr.; at San Remo to $9\cdot7^{\circ}$ Fahr.: leaving a difference in favour of the latter place of nearly 3° Fahr. On comparing Professor Goiran's record of mean temperature for the months January, February, and March, 1865, with that of Nice, I found a difference of nearly 2° Fahr. in favour of San Remo. The number of rainy days is 45 ; the smallest number of all the places described ; and Dr. Daubeney found the average difference at 9 a.m. between the bulbs, for the winter 1866-7, to amount to $3\cdot7$ Fahr.: while at Nice it was $2\cdot7$ Fahr., and at Hyères $2\cdot9$ Fahr.

The climate is warm and dry ; and from the protecting ranges not rising precipitously, as at Mentone, but sloping gradually back, the shelter from northerly winds is not quite so perfect as at the last-named place. At the same time the vast olive-grove screens the locality from any cold blasts, and the breezes which filter through the olives, impart a

pleasing freshness to the atmosphere, and remove sensations of lassitude often experienced in well protected spots. The size of the sheltered area gives patients a considerable choice of residences, which can be found either close to, or at varying distances from, the sea, according to the requirements of the case: while the numerous wooded valleys, abounding in exquisite wild flowers, provide plenty of donkey and foot excursions.

Not far from San Remo is the valley of *Diano*, a well sheltered dell of olive-wood, which may some day furnish sites for invalid residences.

Nervi, on the Eastern Riviera, about an hour's drive from Genoa, stands on a ledge of level ground, which descends in rocky masses into the Mediterranean; here affording boating, bathing, and tolerable fishing. The place is well sheltered to the north and east by wooded hills, on whose sunny slopes the orange and lemon flourish. Olive groves, besprinkled with villas and picturesque hamlets, rise about the village; and the view from this spot of the Bay of Genoa and the Col de Tende range is exceedingly beautiful. A good hotel and boarding house (*Hôtel d'Angleterre*) with well sheltered grounds, pleasant walks and rides, and its short distance from Genoa, render Nervi attractive

to invalids, many of whom have safely wintered there.

As we travel along the Eastern Riviera, we see many sheltered spots suitable for winter residences ; but at present the accommodation is not sufficiently good for invalids. Such are *Recco*, *Porto Fino*, *Chiavari*, &c. So, to use Dr. Bennet's expression, "we can only admire and pass on." The Italian Admiralty Works preclude *Spezia* from becoming a winter resort ; though its neighbourhood, as furnishing sites for invalid residences, fully deserves the encomium passed on it by Dr. Chambers. We now come to—

Pisa, a most interesting city, situated six miles from the Mediterranean, on the banks of the swift-flowing Arno. It lies in the midst of a large plain, parts of which are marshy ; and as far as I could judge, after inspecting its position from the top of its far-famed leaning tower, it does not enjoy much protection on any side.

The Apennines, which rise to the north of the town, and are snow-capped in winter, are too distant to afford it much shelter. On the east the Tuscan hills give some protection ; but it is open to winds from all the other quarters. The mean winter temperature is 44·8° Fahr., and the annual rainfall 45

inches. The climate is moist, unstimulating, and sedative, and bears certain resemblances to that of Pau: but the locality is damper and not so well sheltered. The Lung' Arno, the principal promenade, is tolerably well protected: but excursions in the neighbourhood, particularly the one to "Le Cascine," are open to the dangers which arise from exposure to cold winds. The climate of Pisa has a high repute among the Italians themselves; and its sedative character may perhaps recommend it for the inflammatory type of phthisis. The hotel accommodation is excellent, the Hôtel de la Grande Bretagne being one of the most comfortable in Italy.

Rome was formerly recommended by Sir James Clark and other eminent physicians as a winter residence for patients in the early stages of phthisis, and for some forms of pulmonary disease.

It enjoys a higher mean temperature in winter than might be expected from its isolated position in the midst of a vast plain, and situated at a considerable distance from the surrounding mountains. The range of temperature is great; and the number of rainy days rather large when compared with the numbers at Nice and in the Riviera. It is exposed to the influence of winds from all quarters, and notably of the *Tramontana*, or north wind; and the *Sirocco*, or

south-east wind ; and the alternations of temperature accompanying the changes between northerly and southerly winds, render Rome by no means a safe winter residence for pulmonary invalids. The surrounding campagna, with its marshes, exercises an undoubtedly malarious influence on the city and its neighbourhood ; and unfortunately visitors are liable even in winter to suffer in some way or other from this influence. Intermittent and remittent fever are the most severe forms of disease ; but to the same cause may be traced the headaches and *migraine* often complained of at Rome.

My colleague, Dr. Pollock, who practised for seven years at Rome, informs me that during that period he always had cases of intermittent or remittent fever under his care even in winter. The prevalence of acute disease of the respiratory organs at Rome, to which so many physicians bear testimony, may be ascribed to the vicissitudes of temperature, and not to any stimulating influence of the climate, which, on the contrary, is rather moist and sedative, and somewhat resembles that of Pisa. The air is soft and warm in fine sunny weather ; and when the above-mentioned winds are not blowing, there is a calmness of atmosphere, which is suitable to some forms of chest disease. Patients suffering from the

chronic form of phthisis, by restricting their walks and drives to the more sheltered parts of the town, when the winds blow, have, according to Dr. Pollock, passed winters safely here.

I may however generally state, that a careful survey of the large cities of Italy, such as Rome, Florence, and Naples, has convinced me, as it has many other medical men, that the excitement and fatigue of sight seeing, the gaiety, and the exposure to extreme temperatures, which a residence in them commonly involves, render them quite unfit winter stations for pulmonary invalids. These, in the midst of the temptations offered by the treasure houses of ancient and modern art, forget the objects for which they have been exiled from home, and foolishly expose themselves to cold, fatigue, and other dangers; thereby frustrating the intentions of their physicians, who have recommended a winter in the south; relying that patients, if they quit their native land for the improvement of health, will have the good sense to keep the object of their exile always in view, and not expose themselves to unnecessary and often fatal dangers; but rather devote their attention wholly and solely to reaping the full advantages to be derived from the substitution of a southern for a northern winter. Far safer and wiser

is it to lead a quiet and tranquil life in one of the above-described health resorts, apart from the fascinations of draughty picture-galleries, and cold museums of sculpture: and to rest contented with the ever-varying and beauteous feast of nature's charms, bounteously spread and safely partaken of, and the enjoyment of which is doubly enhanced by a knowledge of the great laws of natural science, which, by the accuracy with which they interpret nature, testify to their own truth.

Besides the above objections to the large towns of Italy as winter stations, Naples lies under a still more powerful one, in its bad drainage; which is so arranged that a large amount of the sewage of this densely populated city is conducted through the visitor's quarter, and discharged on the shore, or into the almost tideless sea, in front of the public gardens and principal hotels. The Chiaja, where the chief accommodation for strangers is to be found, adjoins this outfall of large sewers, which directly communicate with the external air by means of holes constructed for the purpose of carrying off the rain-water, but serving also as vent-holes to conduct the smells and noxious vapours into the thoroughfare and the neighbouring houses. Should a pulmonary invalid wish to escape from the dangers of Naples, arising

from its exposed situation and its unhygienic state, he may find refuges in its neighbourhood, not equal in point of protection to the French stations, but still having a certain amount of shelter from cold winds.

The beautiful island of Capri, whose rocky outline rises in full view of Naples, and from the brilliant transparency of the southern atmosphere often appears but a short distance from the shore, enjoys a mild and equable climate throughout the winter. The town of Capri, and several of the villas, are protected from most of the northerly winds by the precipitous rocks of Anacapri; but there is no shelter from other winds, and the island is occasionally subject to stormy weather. Wherever there is sufficient soil to till, the vegetation is rich, as shown by its fruits, oil, and far-famed wine; and a variety of the fan palm is to be seen growing wild in the crevices of the rocks on the north side of the island. Capri is nineteen miles from Naples, and can be reached by the steamer which plies two or three times a week. The hotel accommodation is good; and patients have passed very tolerable winters there.

Salerno is situated on the northern shore of its gulf, at the foot of the St. Angelo mountains, which

screen it from northerly and easterly winds, and afford it greater protection than is enjoyed by any town on the Gulf of Naples. It faces south; and the force of the Sirocco wind is broken by the Posidian promontory, which limits the Gulf on that side. On the south-east lies a fertile strip of level country, afterwards widening out into the malarious plain of Pæstum; but, as a part of the Gulf separates this marsh from Salerno, the town is shielded from its dangerous effluvia by the intervention of salt water. I was informed by the intelligent chemist of the place that intermittent fever is rare in winter; but in summer the whole tract of flat country becomes malarious; and then fever prevails among the inhabitants. The climate is mild and sunny; and from the locality being situated on the sea-coast the air is stimulating. The town is only two hours by rail from Naples; and is one of the cleanest and least smelling of those that I visited in South Italy. The Hôtel d'Angleterre is excellent; and many delightful excursions by boat and carriage can be made into the surrounding country; always avoiding the popular but rather dangerous one to Pæstum.

Proceeding along the lovely coast-road on the north side of the Gulf, we pass the picturesque villages

of the Eastern Costiera, some day destined to be used as winter stations, and reach Amalfi, a town placed on the southern shore of the Sorrentine promontory, with mountains rising boldly in the background, and protecting it from northerly winds. It is built at the mouth of the narrow Valle de' Molini, ending in, but not penetrating, the St. Angelo range. Down this gorge a torrent, which turns a number of macaroni and paper mills, descends to the sea, and impairs the otherwise complete shelter of the place ; which has rocky masses rising north, east, and west ; and is only open to the south, from which quarter it occasionally experiences stormy weather. The climate is probably warmer than that of Salerno ; and excursions by land and water can be made into its beautiful neighbourhood, the scenes and brilliant colouring of which have been made so familiar to us by the labours of many great artists. The macaroni here is excellent ; and the Hotel Capucini is comfortable, though placed in rather a noisy spot.

The northern side of the Sorrentine promontory is open to the full influence of the Tramontana ; and therefore its numerous towns, Sorrento, Vico, Massa, &c., furnish agreeable and cool retreats in the summer ; but their northern exposure, and their

being shut out from the south by the St. Angelo range, render them unfit for winter resorts for pulmonary patients.

The accommodation at Sorrento is good, the food excellent, and the excursions in the neighbourhood numerous and charming; but the hotels and houses are built facing the north, and not so well suited for winter as for summer. Generally speaking, it is advisable for pulmonary invalids to return to England at the end of spring, and reap the advantage of a cool summer and more generous living. Should a patient, however, find it inconvenient to do so, and prefer to linger near his southern refuge, he will find in the beautiful *Piano di Sorrento*, the vast garden of oranges and vines in which the town lies, a locality for a summer residence, as enjoyable as it is healthy; combining the cool breezes of the Bay of Naples with its lovely views. The plain is three miles in length, and at an elevation of about 300 feet above the Mediterranean. It is besprinkled with villas, and from the varied colours of its vegetation forms a beautiful prospect from the adjoining hills.

We must not close this notice of the French and Italian winter stations without a parting tribute to the beautiful sea, which by its genial warmth con-

tributes so powerfully to the mildness of their climate, and forms so important an element of their healing influence. The Mediterranean, on account of the deeply indented character of its coast line, and the numerous headlands and creeks which its waters lave, is closely intermingled with its sunny shores; and, from its high temperature throughout the winter, they derive as much warmth as they do beauty from its exquisite and ever-varying hues.

THE END.

Accession no. 31431

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